New Evidence About The Relation Between Credit Availability And Investments Contraction During Systemic Banking Crises

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ABSTRACT

Economic literature has revealed the existence of some biases in the identification of the linkage between the supply of credit and aggregate output in periods of financial turbulence. From this perspective, when a banking crisis occurs a contraction of credit offered by banks generally happens, accompanied by a slowdown in economic activity. In these circumstances, there are different directions of causality that explain the coexistence of these two fundamental phenomena, the credit contraction and the economic slowdown. Throughout the analysis of 76 episodes of systemic banking crises, we research for the main determinants and effects which interested with different intensity 54 countries, in terms of credit restriction and economic slowdown. Evidence obtained from the analysis, by considering different components of demand and supply of credit during financial crises, lead us to significant findings, supporting the hypothesis that, under specific circumstances, credit contraction during financial crises is more to be ascribed to the reduction of credit demand from household and enterprises, rather than to a voluntary reduction of credit from banks.

Keywords: Banking Crisis; Investments Contraction; Credit Crunch; Lending Channel

INTRODUCTION

Economic literature has revealed the existence of some biases in the identification of the linkage between the supply of credit and aggregate output in periods of financial turbulence. From this perspective, when a banking crisis occurs a contraction of credit offered by banks generally happens, accompanied by a slowdown in economic activity. In these circumstances, there are different directions of causality that explain the coexistence of these two fundamental phenomena, the credit contraction and the economic slowdown. The direction of causality depends, in turn, from the genesis of the crisis: for example, banking crises arising from liquidity shocks can impact directly on slowing growth, whilst in cases where crises are triggered by the deterioration of economic fundamentals, such as, for example, the reduction of investments from borrowers because of the uncertainty about economic perspectives, it becomes more difficult to ascribe the economic downturn to the banking system. Moving from the most recent dataset of Laeven and Valencia (2010), we created a unique and original dataset, where 76 episodes of systemic banking crises are considered, in order to investigate for the main determinants and effects, which interested with different intensity 54 countries, in terms of credit restriction and economic slowdown. Evidence obtained from this analysis, by considering different components of demand and supply of credit during these crises, lead us to significant findings, which can contribute to the understanding of the mechanism by which these episodes occur, together with the instruments that can be used in order to avoid, or mitigate their effects. From this perspective, we find as significant the effects that can result from the degree of financial development, together within the characteristics of financial firms and the capacity of banking system to provide credit to economic activity even during financial turbulences. Therefore, our paper supports the hypothesis that, under specific circumstances, credit contraction during financial crises is more to be ascribed to the reduction of credit demand from household and enterprises, rather than to a voluntary reduction of credit from banks. We

consider this body of evidence of a particular interest, in order to be considered for the adoption of appropriate policies to reform the governance of financial system and resolve the actual condition of economic fragility.

THE AVAILABILITY OF CREDIT DURING BANKING CRISES

The effects of banking crises on the availability of credit

The phenomenon of banking crises during recent years has taken on an intensity not negligible, with significant effects interesting not only the banks stability, but the entire economic and financial system (Demirgüc-Kunt, Detragiache, 1998; Dell'Ariccia et al., 2008; Cardarelli et al., 2009). By this meaning, a condition of widespread crisis in the banking sector is often accompanied by an interruption of the normal functioning of the payment system, a sharp contraction of credit extended to the production system and a crisis of confidence among depositors with possible capital outflows (Kaminsky, Reinhart, 1999; Hoggart et al., 2002). The ultimate effect may be represented by a sharp decrease in the volume of transactions and productive activity, which tends to remain below its potential level for several years, together with a substantial weakening of the financial position of the intermediaries, which could put threaten their solvency and induce bankruptcies (IMF, 1998). A banking crisis is therefore a phenomenon much more significant than a condition of failure that affects an individual bank, as it is characterized by a pervasive diffusion, which is magnified because of the existence of ties between the banks themselves, because of the existing relationships on interbank market, as well as the interactions between banks and other sectors economic sectors (Laeven, Valencia, 2008, 2010; Reinhart, Rogoff, 2009; Pesic, 2011).

Despite the efforts of economic literature in order to research for the determinants and effects of banking crises on economic growth, the mechanisms in which banking crises may have an impact on income are not yet explicitly addressed in the literature. A noteworthy reference is contained in the paper by Claessens et al. (2008), where the Authors explicitly consider banking crises within the contraction of bank's credit. From this perspective, the supply of credit is the typical element of banking likely to produce effects on output: for instance, this is the perspective which is generally considered by economic literature that examines the real effects of banking crisis on the basis of micro data analysis. However, it should be noted that banking crises can have adverse effects on economic activity through channels other than credit: for example, it is possible to consider that a continued lack of confidence among depositors and banks, which can typically happen during crises, can lead to the paralysis of the payment system and to a sharp slowdown in transactions (Bordo et al., 2000; Allen, Gale, 2007). Moreover, it can be considered the real impact that banking crises can produce in an open economy: when bank runs occur in the banking system, the objective of providing liquidity to credit intermediaries can conflict with the maintenance of currency stability (Frankel, Rose, 1996). Therefore, the banking crisis can help to generate impairment and, thus, increase real effects through the channel of the exchange rate.

Ambiguity of the causal link between credit crunch and economic slowdown

As already mentioned, financial crises have been broadly investigated by economic literature, even if there has not been any ultimately indication about the effects exerted by banking crises on the progress of economic activity: above all, it has been quantified the extent to which credit to private sector and aggregate output decrease during crises. From this perspective, there is still a lack of knowledge about the link of causality during this phenomenon, as well as there is a fundamental identification problem about the relation between turbulence in the banking sector and aggregate demand. In particular, the coexistence of these phenomena is indeed compatible with different directions of causality, which involve multiple mechanisms of propagation between financial and real cycles (Bernanke et al., 1991; Caprio, Klingebiel, 1996 and 1999; Boyd et al., 2005). On the one hand, it is possible that the slowdown in economic activity is induced by the banking crisis, because of a reduction of credit's supply. On the other hand, it can also be assumed that the causal mechanism is exactly the reverse, namely that the reduction of aggregate demand determine a lower demand for credit. In this second case, the slowdown in lending to households and businesses would not be the cause, but more likely the effect on the financial sector by the slowdown in economic activity. Nevertheless, the identification problem does not end in finding an unambiguous direction causality. Economic output and bank credit are likely to shrink during a banking crisis, together with significant problem of illiquidity and bad loans' quality suffered from the banking system. As highlighted by Dell'Ariccia et al. (2008), the same negative shocks which generate problems for the banks can cause the decline in

aggregate demand, prompting companies to reduce investments and capital and, ultimately, to reduce the demand for bank credit. Otherwise, these shocks, even if not directly impacting on corporate profits, could increase the uncertainty and induce firms to postpone investments decisions. Moreover, another reason why, regardless of causality, these two phenomena - the banking crisis and slowdown in output - occur together is the inherent procyclicality of the financial system, which amplifies the fluctuations in economic activity (Cecchetti et al., 2009). As illustrated by Panetta et al. (2009), if there is a negative shock to asset prices - a phenomenon typically associated with periods of economic slowdown - this results in a deterioration in the balance sheets of households and firms, which are shrinking the value of their collateral and, thus, worsen the conditions of access to bank credit. At the same time, the reduction in prices is also reflected on bank balance sheets, reducing equity and increasing leverage. Because it is more expensive to raise capital in downturns, banks respond by liquidating assets. Both phenomena are likely to exacerbate the initial slowdown, whether this was due to a restriction of credit, whether the source was uncorrelated with the banking system.

The role of banks system for the transmission of crises

The research for the role of credit in the transmission mechanism of crises can be analyzed by referring to the theoretical models related to the credit channels of monetary transmission. This literature examines the transmission mechanism of interest rates on the asset side of borrowers and liabilities of banks and, through them, on the financing of the economy. Although this literature attempts to examine the effects of monetary policy decisions, the highlighted mechanisms may be applied to understand the effect that financial disorders may have on the financial condition of banks and borrowers.

Economic literature on monetary transmission mechanisms generally refers to the application of a principal-agent model in markets characterized by imperfect information, such as financial markets, where there are adverse selection and moral hazard. As a result of informational imperfections, both for financial intermediaries and for borrowers, the sources of external financing are more expensive than internal sources: from this perspective, the Modigliani-Miller theory of neutrality of the financial structure is denied, so that different sources of internal and external financing are not perfect substitutes (De Blasio, 2004; Del Giovane et al., 2010). This means that for families and businesses, especially medium and small size, the bank financing is more expensive than self-financing. Similarly, for banks and businesses, the financing obtained on the market, through capital increases or bond issues, is more expensive than self-funding and deposits. Moreover, it can be assumed that this differential is procyclical, as well as the premium payable for external funding increases during deceleration of economic growth, whilst decreases during growth phases.

Starting from this perspective, economic literature distinguishes two direct transmission channels, respectively the *credit channel* and the *bank capital channel*, together with an indirect channel, which operates as a feedback effect, the *broad credit channel*.

The bank lending channel

The *bank lending channel*, also called *credit channel*, is described by Kashyap and Stein (2000), who refer to the effect on the supply of bank credit exerted by a shock that reduces deposits, or other passive voice of the bank subject to reserve requirements. Because of this mechanism, if the bank experiences difficulties in raising funds not subject to a reserve, the so-called non-reservable liabilities, such as bonds, than a reduction of deposits can not be entirely offset by the increase in wholesale funding, so that the total bank liabilities are reduced. Therefore, in these circumstances banks are forced to reduce their assets. Consequently, if the bank fails to substitute securities and loans, in order to reduce the first in favor of the latter, the contractions of liabilities implies a reduction of loans to households and firms. This reduction can determine real effects especially if families and businesses cannot fully offset the decline in bank lending to self-financing and capital market. This mechanism is the more traditional transmission channel of banking crises to real economy: it is generally particularly significant in less developed economies, as well as it is originated as a decrease in liabilities of banks, particularly of deposits, which typically are connected to financial panics and bank runs.

The bank capital channel

Economic literature has traditionally discussed, together with the credit channel, another mechanism which directly influences the availability of credit for economy, the so called *bank capital channel*, which concerns the effect that shocks on capital can put across real economy. This mechanism operates under regulatory requirements on capital, where imperfect substitutability of different sources of bank liabilities within maturity transformation occurs (Ferguson, 2002). The condition of maturity mismatch, which generally characterized banks, makes them exposed to flotation of interest rate, so that an increase or decrease of interest level can determine even a severe loss for banks, and hence, a deterioration of their capital. If banks are subject to capital requirements and a capital increase is retained expensive, they must reduce liabilities to restore capital to the levels required by the regulatory system: therefore, the amount of credit granted to families and firms has to be reduced (Lindgren et al., 1996). From this perspective, the bank capital channel is one of the typical mechanisms that give rise to the procyclicality of financial sector, as it captures the effect of the slowdown in the supply of bank loans, which in turn amplifies cyclical fluctuations (Panetta et al., 2009).

The broad credit channel

The *broad credit channel*, which is also called as financial accelerator channel, considers the effect that negative shocks on the financial position of borrowers can have on their credit availability: more comprehensively, in this framework the net worth of borrowers, represented by the sum of net assets in cash and fixed assets, is considered like a collateral to be offered to lenders (Oliner, Rudebusch, 1996). Because of the presence of information asymmetries, financial crises increase the cost of external finance rather than internal financing: this occurs because, when creditworthiness of borrowers deteriorates, the risk of moral hazard becomes more significant, because of agency costs suffered by lenders for the selection and monitoring activity. At the same time the availability of internal funds decreases. The combination of these two factors leads to a reduction in demand for investment by borrowers: therefore, unlike traditional *credit channel* and *capital channel*, which are related to the mechanisms of credit offer, the *broad credit channel* refers to the demand side, with the effect which is not dependent from deterioration of bank liabilities (Gambacorta, Marques-Ibanez, 2001). From this perspective, when a restrictive monetary policy occurs, even if banks are able to isolate the supply of credit by the reduction of deposits or the deterioration of the capital required for regulatory purposes, the rising cost of external finance, however, would induce firms to lower investments and, thus, to a reduction in production (Gambacorta, Mistrulli, 2003; Gaiotti, 2011). By this meaning, the real effect of banking crises is not due to problems of bank capital, but is due to the physiological tightening of lending by banks, even healthy ones, which are worried about the riskiness of borrowers as a result of the deterioration of their financial condition (Demirguc-Kunt et al., 2006; Duttagupta, Cashin, 2008; IMF, 2008). As we are going to explain later, in this paper we try to speculate about the role that banks can have in order to support economy during a financial crisis, by making credit available to households and enterprises in order to support their financing requirements. In particular, we are looking for any direction of causality between the credit contraction and economic slowdown occurring during crises, supporting our hypothesis that the credit contraction is more determined by a contraction of demand of loans, due to the uncertainty about the economic perspective of borrowers, rather than to a reduction of financial firms offer.

EMPIRICAL ANALYSIS

Dataset description

In order to perform our analysis we created a unique and original database comprising 76 episodes of systemic banking crises, happened in 54 countries between 1976 and 2010, collected from Laeven and Valencia (2008 and 2010). In this case, a systemic banking crisis is defined as a situation where: companies and the country's financial sector have a large number of defaults, companies and financial institutions have serious difficulties in repaying their debts to predefined deadlines, there is a sudden increase in pain and exhaustion of most of the capital or the total of the entire national banking system, there is a presence of significant government interventions. We excluded those banking crises that, affecting banks, have not a systemic nature. All variables considered relevant were taken into account for each episode of banking crisis annually, in the time interval [t-5, t+5], with t for the year of the beginning of each crisis. Besides the annual values were estimated also the mean values in the 3 and 5 years preceding and following the year of origination of the crisis. Therefore, we have been able to look at the variation of

each variable within a short-term, a medium-term and a long-term perspective. More in particular, we looked at their variation within a short-term perspective, by considering the variation between 1 year before and 1 year after the crisis. We analyzed the medium-term perspective, by considering the variation between the mean value of 3 years before the crisis and 3 years after the crisis. Finally, we looked at the long-term perspective, by considering the variation between the mean value of 5 years before the crisis and 5 years after the crisis.

Methodology of analysis

The effect of banking crises, which we considered in terms of *Credit Rationing*, *Investments Contraction* and *Consumptions Contraction*, are examined from the following model:

effect of banking crisis = f (financial intermediation, macroeconomic, control variables)

In particular, in order to considered the above effects of banking crises, we tested different versions of the model, as follow:

- for *Credit Rationing*, we considered three different term perspectives, respectively *short-term*, *medium-term* and *long-term*, by considering a basic model including *financial intermediation* and *macroeconomic* variable, than including in the model the *crisis severity*, and finally including both the *crisis severity* and the *variation of investment* (which we measured through different variables);
- for *Investments Contraction*, we considered three different term perspectives, respectively *short-term*, *medium-term* and *long-term*, by considering the same basic model including *financial intermediation* and *macroeconomic* variable, than including in the model the *crisis severity*, and finally including both the *crisis severity* and the *variation of credit availability* (which we measured through different variables);
- for *Consumptions Contraction*, we considered three different term perspectives, respectively *short-term*, *medium-term* and *long-term*, by considering the unchanged basic model including *financial intermediation* and *macroeconomic* variable, than including in the model the *crisis severity*, and finally including both the *crisis severity* and the *variation of credit availability* (which we measured through different variables).

Therefore, throughout the use of those models, we have been able to consider both the phenomena of credit contraction and economic slowdown, in order to research for any relation of causality: in particular, through the analysis of different term perspectives, we researched for the determinants of credit contraction, variation of investments, variation of consumptions, attempting to address for homogeneity bias which generally affects empirical researches on this topic.

The most of the variables considered in our analysis are obtained from the International Financial Statistics (IFS): as part of the data on the banking sector, the latter were found mainly from the World Bank's Development Indicators and from the work from Beck, Demirgüç-Kunt, Levine (2010). The macroeconomic data, however, were extracted from International Financial Statistics (IFS), the Datastream database of Thomson Reuters and the World Bank's Development Indicators. We considered of a particular interest the variable representing the output cost of banking crisis, which is obtained as the difference between the actual and potential output levels from the period that a banking crisis starts until the period that the actual output returns to its trend level: we obtained these data from Laeven and Valencia (2008 and 2010). They calculated the output loss as the sum of the difference between the trend "counterfactual" and actual annual real GDP, expressed as a percentage of GDP "counterfactual". The latter was estimated by applying a Hodrick-Prescott filter (HP) series on real GDP in the period [t-1, t-20], with t for the year of start of the crisis.

Description of the variables

In order to perform our analysis, we distinguished the following variables for financial intermediation: we considered *Total Assets/GDP*, which is the Ratio of Bank Total Assets to GDP, calculated using the index of consumer prices annual average. Then, we considered *Bank Deposits/GDP*, which is the Ratio of Bank Deposits to GDP, calculated using the index of consumer prices annual average. We looked at *Loans to Private Sector/GDP*, which is the Ratio of Loans to Private Sector by deposit banks to GDP, calculated using the index of consumer

prices annual average. Finally, we considered *Banks Concentration*, which is the Ratio of Total Assets of the three largest domestic banks to Total Assets of the entire banking sector.

We distinguish also the following variables for a macroeconomic standpoint: we considered *Fix Investments/GDP*, which is the ratio of Fix Investments in the Country to GDP, calculated using the index of consumer prices annual average. We considered *Private Sector Consumptions/GDP*, which is Ratio of Private Sector Consumptions to GDP, calculated using the index of consumer prices annual average. We looked at *Refinancing Lending Rate*, which is the interest rate charged to operations funding to the banking system by the Central Bank. Then, we considered *Inflation Rate*, which represents the Consumer Price Index. Finally, we considered *Annual GDP Growth Rate (%)*, which represents the annual rate of growth of GDP at market prices based on constant currency.

In order to control for the intensity of the crisis, we considered the Output Loss, which is the difference between the actual and potential output levels from the period that a banking crisis starts until the period that the actual output returns to its trend level (we derived it from Laeven and Valencia, 2008 and 2010).

Finally, in order to control for the relation of causality between credit contraction and economic slowdown, we considered the following financial variables: *Variation of Credit from Domestic Banks/GDP*, *Variation of Credit to Private Sector/GDP*, *Variation of Credit to Central Government/GDP*, *Variation of Gross Investments/GDP*, *Variation of Gross Fix Investments/GDP*, *Variation of Private Sector Consumptions/GPD*, *Variation of Central Government Consumptions/GDP*, *Variation of Total Consumptions/GDP*. For the whole of these variables, we calculated the variation within the short, the medium and the long term perspective.

In Table 1, we reported the main descriptive statistics, for the dependent and independent variables we have already described: as is it possible to consider, there is a relevant heterogeneity between the episodes of crises, which occurred in countries with different characteristics of financial and macroeconomic conditions of development. Moreover, it is possible to appreciate that after financial crises there is a decrease of gross domestic product, especially in the short term, and a contraction in investments, rather than a contraction of private consumptions and availability of credit for economy. Nevertheless, the relevant dispersion within the dataset requires to be very careful in order to make any consideration as a general statement, making even more significant to suggest a proper analysis in order to consider all the potential variables influencing this phenomenon.

Table 1 – Descriptive Statistics

	Average	Max	Min	Std. Dv.	25° perc.	75° perc.
Total Assets/GDP	71,61	251,88	4,90	57,71	30,23	101,19
Bank Deposits/GDP	52,51	389,57	1,67	55,82	22,00	68,15
Loans to Private Sector/GDP	62,22	191,76	1,71	53,54	25,16	83,30
Banks Concentration	61,08	100,00	16,07	22,90	40,95	76,13
Fix Investments/GDP	22,53	42,50	4,72	6,55	18,88	26,67
Private Sector Consumptions/GDP	62,67	87,20	31,97	10,79	54,26	70,66
Refinancing Lending Rate	21,48	310,99	0,50	43,99	5,00	20,13
Annual GDP Growth Rate %	3,02	10,22	-11,36	4,54	1,62	5,91
Output Loss	32,78	116,00	0,00	28,85	10,50	45,00
Annual GDP Growth Rate % $_{t+1}$	-0,06	0,84	-0,62	0,22	-0,17	0,04
Annual GDP Growth Rate % $_{t+3}$	0,06	1,44	-0,52	0,32	-0,12	0,17
Annual GDP Growth Rate % $_{t+5}$	0,15	1,75	-0,46	0,40	-0,07	0,28
Δ Gross Investments/GDP$_{t-1/t+1}$	-4,68	2,96	-21,37	4,84	-6,70	-1,68
Δ Gross Investments/GDP$_{t-3/t+3}$	-4,02	5,20	-20,13	5,02	-5,95	-0,55
Δ Gross Investments/GDP$_{t-5/t+5}$	-3,27	7,09	-18,49	4,98	-5,52	0,03
Δ Private Consumptions/GDP$_{t-1/t+1}$	0,98	11,38	-9,74	3,95	-0,83	2,98
Δ Private Consumptions/GDP$_{t-1/t+2}$	0,93	21,12	-8,29	5,01	-2,28	2,86
Δ Private Consumptions/GDP$_{t-1/t+3}$	1,11	25,67	-9,21	5,08	-1,25	3,07
Δ Credit from Domestic Banks/GDP$_{t-1/t+1}$	3,55	94,14	-124,98	29,02	-3,06	14,23
Δ Credit from Domestic Banks/GDP$_{t-3/t+3}$	8,33	119,85	-84,64	28,06	-3,09	17,86
Δ Credit from Domestic Banks/GDP$_{t-5/t+5}$	10,31	93,02	-91,18	28,21	-3,64	23,14

EMPIRICAL EVIDENCE

To perform our analysis, we regressed the most relevant variables which characterize the economic performance of each countries, before and after each crisis, in order to investigate for the main determinants and effects, which interested with different intensity 54 countries where these crises happened. In particular, in order to investigate for the relation of causality between availability of credit and economic growth, we tested different model of regression across alternative term perspective, in order to understand the motivations of variation of credit availability to economic, level of firms investments and private consumptions. In this regard, we consider of particular interest the evidence we obtained about the factors that seem to influence those variables, with significant differences that result from the degree of financial development, together with the characteristics of financial firms and the measure of severity of systemic banking crises.

In particular, in Table 2 the results we obtained about the variation of credit availability from domestic banks after crises are reported: in particular, the table shows that availability of credit from domestic banks is determined by the characteristics of bank systems, with the capacity of commercial banks to make more loans available to economic system (a positive and significant coefficient in all the specification of the model, especially for a short and medium term perspective). On the opposite, the dimension of banks system does not appear to be, per se, a condition influencing the capability to allocate credit to economic activities. Moreover, the severity of crisis does not appear to influence the credit availability, whilst the increase of credit is strictly related to the increase of investments, especially when considering a medium and long term perspective.

In Table 3, we report the results we obtained for the variation of gross investments after crises. In particular, we show that the increase of gross investment is negatively influenced by the severity of crisis (measures as the output loss of the crisis) and the level of fix investments before the crisis. Therefore, it seems that during economic turbulence, individuals are more concerned on dissipating resources without having a clear idea about the future. On the opposite, the annual GDP Growth Rate pre crisis seems to positively influence the variation of investments, as well as the refinancing lending rate. We consider particularly interesting the evidence that the availability of credit does not appear to influence the variation of gross investments after crisis: this result seems to confirm our hypothesis that the reduction of investments is more likely caused by the uncertainty about economic perspectives, rather than to a reduction of credit availability from banks.

In Table 4, we consider the results for the variation of private consumptions after the crises. From this perspective, the table shows that private consumptions after crises are negatively influenced by the level of consumptions before the crisis, the refinancing lending rate and the annual GDP growth rate before the crisis. On the opposite, private consumptions are positively influenced by the output loss: even if it could seems surprising, this evidence appears to be determined by the reduction of GDP occurring especially in countries experimenting a more severe output cost. Similarly to investments, the availability of credit does not appear to influence the variation of private consumptions after crisis: so that we can confirm our idea about the relation of causality between supply and demand of credit during financial crises.

Table 2 – Variation of Credit from Domestic Banks

	Basic Model			Basic Model + Crisis			Basic Model + Crisis + Δ Inv.		
	Short Term	Medium Term	Long Term	Short Term	Medium Term	Long Term	Short Term	Medium Term	Long Term
Constant	3.8782 (0.1845)	73.7083** (2.5676)	72.8262** (2.5170)	-10.2154 (-0.4314)	70.6300* (1.8936)	46.0289 (1.2151)	-22.65625 (-0.8949)	-45.7271 (-1.4127)	-53.1572 (-1.3418)
Total Assets/GDP	-0.5729** (-2.5090)	-0.5112 (-1.5008)	-0.5288 (-1.4850)	-0.5885** (-2.3868)	-0.5571 (-1.3363)	-0.4544 (-1.0533)	-0.6810** (-2.7325)	-1.1574*** (-3.7578)	-1.0889** (-2.6202)
Bank Deposits/GDP	0.0795 (0.6286)	0.0764 (0.3721)	0.1519 (0.6966)	0.0860 (0.6138)	0.1282 (0.4967)	0.1942 (0.7503)	0.1170 (0.8437)	0.1043 (0.5606)	0.0459 (0.1903)
Loans to Private Sector/GDP	0.7159*** (3.7291)	0.6409** (2.1529)	0.6089* (1.9466)	0.7622*** (3.7846)	0.6462* (1.8946)	0.5533 (1.5691)	0.8672*** (4.1520)	1.4906*** (5.7053)	1.5653*** (4.4458)
Banks Concentration	-0.1139 (-1.2953)	-0.2046 (-1.4307)	-0.1014 (-0.7066)	-0.0952 (-1.0149)	-0.1588 (-0.9213)	-0.0139 (-0.0825)	-0.0860 (-0.9307)	-0.1861 (-1.4980)	-0.1471 (-0.9243)
Fix Investments/GDP	0.4527 (1.1120)	-1.3492** (-2.4193)	-1.4252** (-2.5623)	0.9935* (2.0583)	-1.5119** (-2.2079)	-1.8544** (-2.7185)	1.4418** (2.3535)	2.4148*** (3.0517)	1.2884 (1.3074)
Private Sector Consumptions/GDP	-0.1877 (-0.7249)	-0.6265* (-1.7206)	-0.7153* (-1.8337)	-0.1952 (-0.6966)	-0.5986 (-1.2913)	-0.4416 (-0.9192)	-0.2473 (-0.8893)	-0.0227 (-0.0667)	0.2480 (0.5492)
Refinancing Lending Rate	0.1341 (0.8045)	0.0537 (0.2773)	0.0939 (0.4708)	0.2346 (1.3631)	0.0113 (0.0428)	0.0747 (0.2905)	0.3812* (2.0155)	0.1670 (0.7797)	-0.0092 (-0.0359)
Annual GDP Growth Rate %	-0.3358 (-0.3721)	1.9690* (2.0202)	2.4929** (2.4664)	-0.2873 (-0.3144)	2.2816 (1.3260)	4.3224 (0.2905)	-0.0968 (-0.1018)	0.2086 (0.1599)	3.3445* (1.7621)
Output Loss				-0.1204 (-1.4223)	0.0684 (0.4619)	0.0696 (0.5190)	-0.0111 (-0.0776)	0.1047 (0.6383)	0.0909 (0.4435)
Δ Gross Investments/GDP							1.4325 (1.0980)	4.2151*** (2.8228)	3.1188* (1.7838)
N. Obs.	37	39	39	33	35	35	32	33	33
Adj. R-squared	0.4644	0.2605	0.2616	0.5009	0.1870	0.2372	0.5352	0.6759	0.6513

The table represents the results we obtained through the OLS regression: alternative models have been developed to test robustness to different included/ excluded variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 3 – Variation of Gross Investments/GDP

	Basic Model			Basic Model + Crisis			Basic Model + Crisis + Δ Credit		
	Short Term	Medium Term	Long Term	Short Term	Medium Term	Long Term	Short Term	Medium Term	Long Term
Constant	-1.7094 (-0.2292)	17.5070*** (3.2723)	-4.8078 (-0.6758)	-5.6290 (-1.2392)	-4.4310 (-0.8891)	-4.8596 (-0.8975)	-5.7030 (-1.1962)	-2.3875 (-0.4408)	-4.0053 (-0.6913)
Total Assets/GDP	0.0612 (1.0088)	0.0442 (1.0033)	0.0370 (0.5344)	0.0797** (2.4508)	0.0754* (1.9576)	0.0570 (1.2783)	0.1283** (2.2789)	0.0810 (1.3782)	0.0679 (1.0335)
Bank Deposits/GDP	0.0163 (0.9946)	0.0014 (0.1167)	0.0171 (0.8814)	0.0062 (0.6976)	0.0051 (0.4710)	0.0046 (0.3842)	-0.0132 (-0.4625)	-0.0125 (-0.3554)	-0.0111 (-0.2839)
Loans to Private Sector/GDP	-0.0694 (-1.1221)	-0.0893* (-1.8826)	-0.0607 (-0.8043)	-0.0486 (-1.4437)	-0.0514 (-1.2480)	-0.0309 (-0.6584)	-0.0977* (-1.8310)	-0.0398 (-0.7974)	-0.0228 (-0.4129)
Banks Concentration	0.0251 (0.7708)	0.0284 (1.1439)	0.0794** (2.1425)	-0.0141 (-0.7763)	0.0043 (0.1920)	0.0238 (0.9781)	-0.0115 (-0.6009)	-0.0073 (-0.3068)	0.0184 (0.7324)
Fix Investments/GDP	-0.5339*** (-3.5179)	-0.5558*** (-4.9140)	-0.3895 (-2.7147)	-0.3490*** (-3.6623)	-0.2149** (-2.3332)	-0.2357** (-2.3193)	-0.3938*** (-3.7117)	-0.2640** (-2.5956)	-0.3078** (-2.6678)
Private Sector Consumptions/GDP	0.1002 (1.1629)	-0.0799 (-1.3574)	0.0676 (0.7469)	0.1196** (2.4608)	0.0527 (0.9297)	0.0397 (0.6307)	0.1465** (2.5351)	0.0478 (0.7302)	0.0439 (0.5976)
Refinancing Lending Rate	-0.0192 (-0.3036)	-0.0832** (-2.4784)	0.0191 (0.3680)	0.0500 (1.4064)	0.0868** (2.3008)	0.1126*** (2.8539)	0.0299 (0.7539)	0.0826** (2.1745)	0.1121*** (2.8268)
Annual GDP Growth Rate %	0.0902 (0.2608)	-0.0101 (-0.0570)	0.2748 (1.0462)	0.3465* (1.8404)	0.3573 (1.4724)	0.5991* (2.0138)	0.3337* (1.7441)	0.4435* (1.7873)	0.7961** (2.4757)
Output Loss				-0.1256*** (-7.6916)	-0.1362*** (-7.0624)	-0.1313 (-6.7842)	-0.1216*** (-6.6808)	-0.1388*** (-6.7957)	-0.1325 (-6.5715)
Δ Credit from Domestic Banks /GDP							0.0467 (1.0786)	-0.0420 (-1.5466)	-0.0440 (-1.4805)
N. Obs.	37	38	39	33	35	35	32	34	34
Adj. R-squared	0.3695	0.5633	0.2177	0.8402	0.7511	0.7198	0.8412	0.7666	0.7341

The table represents the results we obtained through the OLS regression: alternative models have been developed to test robustness to different included/ excluded variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4 – Variation of Private Consumptions/GDP

	Basic Model			Basic Model + Crisis			Basic Model + Crisis + Δ Credit		
	Short Term	Medium Term	Long Term	Short Term	Medium Term	Long Term	Short Term	Medium Term	Long Term
Constant	13.9080** (2.3178)	17.6520*** (3.2442)	14.2490** (2.7185)	15.4383** (2.5859)	20.0555*** (3.1258)	16.0268** (2.6151)	15.1737** (2.4247)	26.0737*** (3.3437)	19.0754*** (2.8437)
Total Assets/GDP	-0.0014 (-0.0297)	-0.0318 (-0.6423)	0.0076 (0.1504)	-0.0029 (-0.0690)	-0.0286 (-0.5782)	-0.0037 (-0.0736)	-0.0608 (-0.8234)	-0.0567 (-0.6701)	-0.0725 (-0.9524)
Bank Deposits/GDP	-0.0013 (-0.0987)	-0.0130 (-0.9300)	-0.0229 (-1.5996)	0.0003 (0.0276)	-0.0125 (-0.8969)	-0.0208 (-1.5197)	0.0196 (0.5221)	-0.0146 (-0.2871)	0.0305 (0.6746)
Loans to Private Sector/GDP	-0.0228 (-0.4591)	0.0046 (0.0873)	-0.0214 (-0.3854)	-0.0329 (-0.7456)	-0.0114 (-0.2159)	-0.0253 (-0.4775)	0.0303 (0.4335)	0.0249 (0.3468)	0.0165 (0.2582)
Banks Concentration	0.0240 (0.9140)	-0.0136 (-0.4875)	-0.0450 (-1.6463)	0.0267 (1.1181)	-0.0026 (-0.0901)	-0.0290 (-1.0526)	0.0218 (0.8674)	-0.0277 (-0.8100)	-0.0197 (-0.6765)
Fix Investments/GDP	-0.0894 (-0.7324)	0.1126 (1.0369)	0.0951 (0.8997)	-0.1732 (-1.3831)	0.0597 (0.5037)	0.0707 (0.6150)	-0.1074 (-0.7710)	-0.0661 (-0.4520)	0.0220 (0.1649)
Private Sector Consumptions/GDP	-0.1253* (-1.8071)	-0.1732** (-2.6526)	-0.1084 (-1.6239)	-0.1109* (-1.7355)	-0.2036** (-2.7870)	-0.1398* (-1.9598)	-0.1403* (-1.8503)	-0.2033** (-2.1540)	-0.1952** (-2.2935)
Refinancing Lending Rate	-0.0947* (-1.8608)	-0.1295** (-3.3979)	-0.1053** (-2.7460)	-0.1285** (-2.7521)	-0.1251 (-2.5764)	-0.1011** (-2.2647)	-0.1027* (-1.9714)	-0.1758*** (-3.2139)	-0.0906* (-1.9730)
Annual GDP Growth Rate %	-0.3283 (-1.1795)	-0.7979*** (-4.1763)	-0.7074*** (-3.6549)	-0.3656 (-1.4774)	-0.8302 (-2.6570)	-0.8739** (-2.5955)	-0.3527 (-1.4042)	-1.0114*** (-2.8308)	-0.8095** (-2.1742)
Output Loss				0.0324 (1.5114)	0.0372 (1.500)	0.0469** (2.1449)	0.0251 (1.0541)	0.0643** (2.1889)	0.0561** (2.4019)
Δ Credit from Domestic Banks /GDP							-0.0669 (-1.1786)	-0.0078 (-0.2000)	-0.0162 (-0.4710)
N. Obs.	37	39	39	33	35	35	32	34	34
Adj. R-squared	0.1057	0.4325	0.3289	0.2110	0.2371	0.2040	0.2184	0.3567	0.2021

The table represents the results we obtained through the OLS regression: alternative models have been developed to test robustness to different included/ excluded variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

CONCLUSIONS

The aim of this paper has been to research for the impact that systemic banking crises may have on the economy, in terms of GDP contraction and credit restrictions, in order to research for any link between these two phenomena. Moving from the most recent dataset of Laeven and Valencia (2010), we created a unique and original dataset, where 76 episodes of systemic banking crises were considered, in order to cover the period from 1976 to 2008: we regressed the most relevant variables which characterize the economic performance of each countries, before and after each crisis, in order to investigate for the main determinants and effects, which interested with different intensity 54 countries where these crises happened. Evidence obtained from this analysis, by considering different components of demand and supply of credit during these crises, lead us to significant findings, which can contribute to the understanding of the mechanism by which these episodes occur, together with the instruments that can be used in order to avoid, or mitigate their effects. From this perspective, we found as significant the differences that can result from the degree of financial development, together within the characteristics of financial firms and the capacity of banking system to provide credit to economic activity even during financial turbulences. Therefore, our paper support the hypothesis that, under specific circumstances, credit contraction during financial crises is more to be ascribed to the reduction of credit demand from household and enterprises, rather than to a voluntary reduction of credit from banks. We consider this body of evidence of a particular interest, in order to be considered for the adoption of appropriate policies to reform the governance of financial system and resolve the actual condition of economic fragility.

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